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30 September 1985

East Europe Report

SCIENCE AND TECHNOLOGY

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HUNGARY

INSTRUMENT USED ON SALYUT-6 DESCRIBED

Budapest NEPHADSEREG in Hungarian 27 Jul 85 p 11

[Article by Viktor Amaczi: "Spider Pille and the Others"]

[Text] Five years have passed since the first Hungarian cosmonaut, Bertalan Farkas, made his successful journey. On the occasion of the anniversary we recalled the scientific program conducted by the crew of Salut-6.

A part of the scientific program was put together by Hungarian scientists and a significant part of the instruments necessary for the experiments was built by Hungarian scientific research institutes, universities and companies.

Balaton

The purpose of the work-capacity experiment was to investigate the changes in the mental ability to do work and in the activity of the central nervous system under the unusual conditions of space flight, and to accumulate data for evaluating the causes of the psychological fatigue of cosmonauts.

The physicians of the Flying Medical Examination and Research Institute of the Hungarian People's Army (ROVKI) and the engineers of the Medicor Works have developed a tool which serves these purposes. The name of the instrument is Balaton.

With the aid of this technique it is possible to express mental work by mathematical means. The instrument, with its built-in program, presents the cosmonaut with a selection of four choices to a problem from which he must choose (signs and figures must be recognized and the corresponding buttons must be pressed). Using the instrument in this way, the correctness of the value and the speed of the decision can be evaluated and the value of the mental work can be computed. All calculations are done by the instrument and the results are displayed.

With the simultaneous measurement of the information processing ability of the cosmonaut, his pulse rate and the galvanic resistance of his skin, the momentary mental ability to do work can be assessed and the funcational reserve of the central nervous system can be charted. These characteristics are automatically measured by the hand-held instrument.

Knowing the variations of the mental work capacity of the cosmonaut, the schedule of work and rest periods, or the work schedule of the crew of the space station can be more efficiently planned.

Diagnostic Equipment

The purpose of the diagnostic equipment is to give a picture of the funcational state of the cosmonaut before and after the flight, via a rapid determination of numerous physiological parameters. For this purpose an instrument was developed by the physicians of the ROVKI and the engineers of the Medicor Works.

The five measuring modules built into the instrument make it possible to measure 11 physiological characteristics. (The first module measures the auditory threshold and the reflex time. The second module determines the values of the blood pressure, pulse rate and body temperature. The third examines the pulmonary capacity and the characteristics of breathing. The first three modules indicate the measured quantities digitally. The fourth module displays the bioelectronic signals of the heart and the brain. The fifth module registers the measured physiological data with its writing device). A big advantage of the instrument is that it can function well under unusual circumstances, such as in the launch position, or after landing in areas far from human habitation.

Experimental Dosimetry

The name of this experiment refers to the measurement of the dose of ionizing radiation reaching the cosmonauts.

In space, besides visible light, fixed stars emit other ionizing radiations of different qualities and energies, such as X-rays, electrons, protons, and even heavier charged particles.

Space ships circling the Earth receive primarily ionizing radiation from the Sun. This radiation, called cosmic radiation, does not pose a threat to people on Earth because the intensity of the radiation is decreased to insignificant values by the maganetic field of the Earth and the atmosphere.

The space stations, however, fly outside the atmosphere and are not protected by it (the effect of the atmosphere is equivalent to the shielding produced by a layer of water 10 meters thick). The space ships are protected only by their walls and therefore the level of radiation inside them is many hundreds of times larger than on the surface of the Earth.

The intensity of ionizing radiations can increase significantly with increased solar activity or during magnetic storms. A spaceship that has left its orbit around the Earth and is outside the Earth's magnetic field may receive dangerous amounts of radiation during increased solar activity. For this reason it is necessary to monitor the cosmonauts' radiation exposure during flight. The thermoluminescent dosimeter can be used successfully for this purpose. It is characterized by small size, wide detection limits and high accuracy.

The thermoluminescent dose detecting materials (TLD) absorb an amount of energy proportional to the radiation to which they are exposed, and they are capable of storing this for years as a change of state. Upon heating, they release this energy in the form of light. The quantity of light emitted is proportional to the dose received, between wide limits.

The thermoluminescent dosimetric experiments were already started in the 1960's in the radiation protection division of the MTA's KFKI [Central Physics Research Institute of the Hungarian Academy of Sciences], and in 1970 became part of the Intercosmos cooperative research program.

TLD-04

The TLD-03 and TLD-04 instruments have been regularly used over several years to monitor the personal radiation load of the Soviet cosmonauts after their return to Earth. Experimental units of the TLD-04 instrument have also been used successfully over the years for the dosimetry of cancer patients receiving radiation, radiation protection for the determination of the gamma background radiation.

In the course of the Soviet-Hungarian space flight two experiments were carried out, the "Integral" and the "Pille". The first of these utilized the already-mentioned TLD-04 instrument, the second the entirely new Pille dosimeter which was developed at the KFKI.

The experiment was aimed at the determination of the dose that has accumulated at various points of the space station during several months. The first part of the series of experiments was already conducted in 1979 in the course of the flight of the Ljahov-Rjumin pair. The Hungarian experts have evaluated the experiments performed with the TLD-04 instrument and have received results in accord with their expectations. The Popov-Rjumin pair took up with them dosimeters from several socialist countries, including capsules containing sensitive thermoluminescent crystalline powders developed at the Technical University of Budapest.

The Soviet-Hungarian pair brought back a part of these from space and the Central Physics Research Institute's radiation protection experts have evaluated the results of the Hungarian dosimeters.

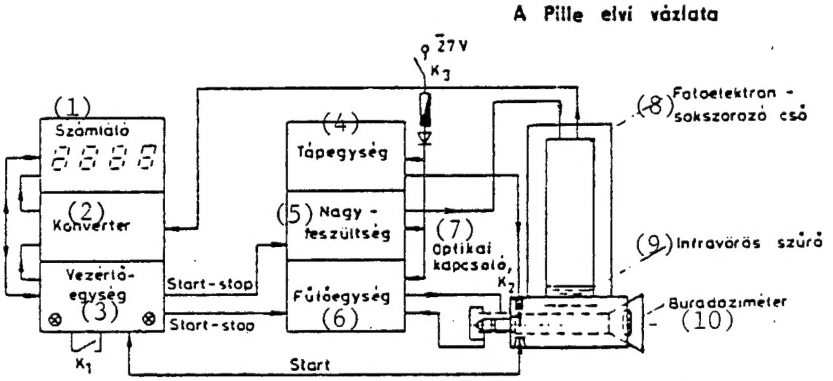
Pille

The Pille instrument was developed by the KFKI to be a radiation-measuring instrument that can also be used on board of the space station. This instrument has the capabilities of the TLD-04, but its weight, size and consumption is significantly less.

The Pille is housed in an unusually novel container which permits the instrument to resist the mechanical strain associated with the launching of the space ship.

The dosimeter probe of the Pille is a small, airtight glass tube with thermoluminescent CaSO4 in it. The dosimeter probes are worn by the cosmonauts clipped to their clothing, or they are fastened to the walls of the space station.

Theoretical Schematic of the Pille



Key:

1. Counter
2. Converter
3. Control Unit
4. Power Source
5. High Voltage
6. Heating Unit
7. Optical Switch
8. Photoelectron Multiplying Tube
9. Infrared Filter
10. Buradosimeter

When a measurement is made, the key-shaped dosimeter probe must be placed in the measuring cavity of the recording device and after about half a minute, when heating is complete, the radiation dose can be read from the digital display.

With the Pille the dosimeter on board of the spaceship significantly adds to the radiation safety of the cosmonauts. The Pille was the first instrument that has made it possible to evaluate the dose received during space flight directly on board of the spaceship.

12846
CSO: 2502/59

HUNGARY

NEED FOR PRIORITIES IN ELECTRONICS R & D

Budapest NEPSZABADSAG in Hungarian 6 Aug 85 p 4

[Article by Dr Zsuzsa Szentgyorgyi, chief advisor of the Hungarian Academy of Sciences: "Tasks of Research in Electronics"]

[Text] In the recent decades of our century the most important driving force of technical progress has been electronics which came into existence from the intertwining of microelectronic technology, computing technology, communication, automation and information technology. By the 1980s in the developed industrial countries the electronic equipment, methods and systems penetrated every branch of the economy and society.

In order to be able to follow this growth in our country as well, to expeditiously utilize electronization in production and services, in the infrastructrue and expansion of culture, there is a need for significant basic research as well as for technical preparatory developments in manufacturing and applications. Electronization must be given the green light in every branch of the economy and in every activity of society, so that it is not even worth listing the types of application branch by branch. The picture becomes even clearer if we look at the areas of roles that will dominate electronization in the second half of the 1980s and in the early 1990s apearing in the various branches of the economy and society. And even these types of applications will be examined primarily from the viewpoint of domestic research and development. Of course, in countries economically more advanced than ours some of these have already gotten past the research level and are present in commerce in the form of equipment, systems or sevices. But we cannot obtain them from there due to political restrictions or economic reasons and therefore they represent unavoidable tasks for us.

Electronized design systems make up one of the most important types of application. In designing the reliability of designing increases and its time decreases through electronics by automating the jobs of routine character (drawings, calculations) and by rapid availability of data information. But accumulating the design information necessary for this requires building of extensive data systems.

Another important type of application is the system of measuring and controlling laboratory processes. These can be expected to gain ground

quickly in several application areas. It is not the same kinds of systems that are needed: primarily smaller ones in the health care, industrial and agricultural laboratories; fast systems with several machines in certain nuclear areas of application.

The electronic systems are also spreading in the measurement of industrial processes and in the regulation of processes. Significant savings can be realized in these areas with relatively few but larger systems. The electronic process measurement and regulatory systems of electrical, gas, oil and water networks, power plants and large furnaces also belong here and must be further developed.

Electronics has already appeared in this country also in the office and enterprise business management systems, but actually it has just arrived an dis far from sufficiently fulfilling its role. Its real significance here can be in laying down the foundations for decisions, in the speed of making decisions and in the ability of making decisions at lower levels. To this end electronics accelerates the flow, processing and storage of information.

Due to great intellectual investments electronics today is a rapidly growing and dynamically changing branch world-wide. Similarly, the process of its spreading--electronization--requires large intellectual investments. Its dynamism can be kept in motion only through significant research work. Of course, whatever is available on the market or in the international sharing of labor, must not be researched--it would be unnecessary expensive. Naturally a certain amount of gathering basic knowledge is also necessary for domestication, to introduce the new equipment and systems in this country.

In the coming years and decades the most important task of domestic research is to establish foundations for the equipment and systems to be manufactured, and for the applications to be implemented. The MTA's [Hungarian Academy of Sciences] research facilities must accept a significant portion of the tasks deriving from this, while others must be accepted by university research facilities as well as by the branch development enterprises.

It is particularly important from the viewpoint of effective application and profitability that rational cooperation based on common interests should become reality in implementation, among the research and development institutions and task forces. This cooperation must be promoted primarily by the national and protfolio-level programs. At the same time the direct industrial and user assignments must have a more significant role than now in carrying out the research and development tasks.

The social science research projects related to electronization deserve special mention. When electronics spreads widely in society, new phenomena and effects are generated. The way these develop and run their course, their mutal effects must be identified and analyzed with scientific methods. We must expect many kinds of social effects and these do not exert their effects uniformly, nor equally, deeply or extensively. Therefore a certain order of importance must be established in researching them. In the interest of examining--and then being able to handle--the various economic, social and

social policy questions it seems expeditious to start grouping these topics without delay. In the first group are those questions which do not need to be researched in this country but--in order to be able to follow their actual appearance--it is indispensable to study the applicable foreign experience. Those questions may be put in the second group for which a certain amount of expert work is necessary if they are to be solved--even if this does not require systematic research work. The third group consists of questions which require really systematic research. In this area the Academy's role is even greater in the basic research projects than in the technical research.

Electronization is growing extremely fast, its scientific background of definitive significance branches out many ways, and requires huge economic and intellectual potential. At the present time two countries--the United States and Japan--determine the growth of the electronics industry on the world market, and even the developed Western European countries can stay in the lead at best in one partial ear or another (for example, Sweden in telephone technology or England in the integrated communications services). The smaller countries import the decisive majority of their equipment, instruments, technological systems and information, and build them into their own technologies and applications with some intellectual additions.

Due to its size, technological and economic level of development, Hungary inherently needs the international cooperation. This applies also to its scientific research opportunities since we can achieve meaningful results only in a few specific areas, while relying on our existing schools and research basis. For this very reason it is extremely important that we participate in the international cooperation but also how we participate in it. Let us take an opportunity as an example, one which seems to have definitve significance for the future,

In the fall of 1984 Hungary was the host to the heads of the socialist academies of sciences. It is a proposal from that time that the computing technolgoy and inforamtion management R&D projects conducted in the socialist countries must be coordinated and improved, and special attention must be paid on the one hand to long term research which lays the foundations for new systems, and on the other hand to establishing the scientific foundations for industrial manufacturing and broad-based application. Based on joint agreement in late 1983 the Computing Technology and Information Processing Coordination Council (SZKT) was established in Sofia by the socialist academies of sciences. At its formation decision was made to develop a comprehensive concept for the tasks to be worked on jointly and for the method of implementing them. The concept was prepared and the concrete programs are being worked out now, the tasks are being assigned. It is only natural that in this work the Soviet Union--due to its size, as well as scientifice and economic nature--is entitled to the most important role.

One important question from the viewpoint of efficiency of doing this work is that whenever possible the research work should be done by bilateral agreements, in bilateral cooperation and with identifying given concrete goals, by assigning responsibility and dealines. The scientific goals must be defined in such a way that whenever possible the shorter term tasks (3-5

years) should connect directly to practical solutions, to helping industry, to the introduction of new products, while the significant portion of the energy should be spent on basic work, basic long range research (over 5 years).

Naturally, in the scientific international cooperation, in addition to working with the socialist countries, we must also count on cooperation with the research facilities and universities of capitalist countries with developed economies, possibly with countries similar to ours in size could be considered, or with countries which themselves are also developing but whose scientific potential is significant. It is absolutely essential for our survival to publish our scientific achievements according to international criteria, to refresh the domestic scientific blood circulation, and to integrate new ideas and results into our own scientific research and technical development.

8584
CSO: 2502/67

MULTIPLE USES OF M80 MICROCOMPUTER

Budapest SZAMITASTECHNIKA in Hungarian Jul 85 p 2

[Article by Attila Kovacs: "Multiple Uses of M80"]

[Text] The MIKI [Instrument Industry Research Institute] Measurement Technology Development Enterprise can already lay claim to quality achievements in the area of development, manufacture and application of distributed intelligence, hierarchic medium and large process control systems based on microcomputers which can be linked into a local communication net. The soon to be realized applications of the M80 microcomputer process control system, which has developed into a family in the meantime, may represent even greater success, aiding the automation of domestic technological processes at an ever higher level and the rational replacement of human manpower, increasing the efficiency and economicalness of processes, reaching higher quality demands and, in the final analysis, realizing material and energy conserving technologies.

System Philosophy

The M80 is suitable for independent control of industrial processes of medium and high complexity. Its modular construction makes possible flexible adaptation to the control task. The solutions built into the hardware and software of the microcomputer control system in advance extend to the smallest possible modules. At the same time they have created very general purpose modules in both hardware (50) and software so that the systems can be built up in a modular fashion for concrete applications. The process control system is built up of microcomputer controlled intelligent devices which themselves are of modular design. Data transmission among the several devices can be wired or wireless (generally UHF).

The basis of the system architecture is multiple level hierarchic organization which, together with the module system, makes possible expansion of the system without changing the structure. In the process control system the highest hierarchical level is assigned to one of the devices (the center). The devices at lower hierarchical levels are the so-called stations, which are linked directly with the controlled process, or are sub-centers to which units at a lower hiearchical level are assigned. Both the stations and the sub-centers can pre-process the information obtained from the controlled process and can

pass so-called filtered information to the higher hierarchical level. This reduces the load on the data transmission line and increases the speed of processing. The operation of the several devices differs according to their place in the system and can be determined in advance with a program.

The M80 Today

By 1985 the M80 has developed into a family capable of satisfying virtually every user need. It has grown out of the earlier telemechanical applications. The basis of it is a microcomputer card assortment tolerant of severe industrial environments and most suitable from reliability and peripheral viewpoints. The system is built on an Intel 8080 parts base and about 50 ESZR [Uniform Computer Technology System] size card modules aid the satisfaction of various applications needs. The hardware possibilities have been expanded further--a color, semigraphic display, light pen and local network coupler, to mention only the most important. Here are a few additional data: 8-64 analog inputs, a maximum of 64 analog outputs and a maximum of 1,024 digital inputs and outputs are possible within a single machine. The impulse number inputs can be varied between 12 and 72 and the number of single center addressable stations is a maximum of 64.

A multitask (maximum 63) software system is available. Synchronization takes place with events (maximum 40), with resources (256) and with messages (16). The base system is programmed in ASM-80 and the user part is programmed in PL/M-80 (both are Intel languages). The M80 system can be made into a software development system too. In the case of applications systems which use floppy disk units file management is solved in a manner compatible with CP/M. The multitask operating system, a version of the RTM 80 realtime monitor prepared this year, can also be put together from modules for concrete applications. The system can also be programmed in concurrent PASCAL.

The peripheral assortment for the system has been expanded; the most extensively used peripherals obtainable in our country can be used (Videoton and Orion displays, MOM [Hungarian Optical Works] floppy disk drives, Terta printers, etc.).

On the basis of the hardware and software development and the peripheral assortment the applications possibilities of the M80 process control system have been expanded to such a degree that MIKI is playing a leading role among domestic enterprises in the control of the processes of very extensive systems and in the application of distributed intelligence process control systems.

High Level Applications

One of the key factors in Miskolc water supply is the Miskolc Peak Waterworks. An M80 system controlling the water production and purification technology will go into operation in the second half of the year. The moderately extended process control--about 10 kilometers--will be handled by a system consisting of three microcomputers and one center, checking the quality of 50 wells with very polluted water, adding the chemicals and filtering. The primary economic goal is to conserve on electric power.

Control of the power supply system for the Budapest 1 express railway with an M80 will also be realized in the second half of this year. Four stations will be put into operation this year and next year, in the maximum version, a total of eight stations will be connected to the Zuglo center. The task of the stations is to ensure uninterrupted power throughout the length of the line. The chief goal is to restore operations, in the event of a power failure, in a good bit less than one minute, instead of the several minutes now.

This year M80's in the field will automatically control the 30 pumping stations of the Capital Sewerage Works. This solution will replace the dispatcher trucks as the several microcomputers will send signals automatically to the center concerning the operation and condition of the pumps.

At the Capital Central Heating Works they are developing a boiler supervision system on an M80 base. The goal here, under very severe conditions, is to be able to replace the operator adequately.

An M80 based water production and distribution net, with a center in Salgotarjan, will be installed this year and next in the area of the Northern Nograd Regional Water Management Enterprise (ENRV). About 15 stations are being built here. The most important goals are the following: replacing operating personnel, saving electric power and providing a continually reviewable picture of the status of the entire system. Nor is it an incidental factor that with the use of the system locating the position of a possible pipe break can be done in a much shorter time than before.

Compared to the control systems used thus far the applications of the M80 microcomputer represent a leap of several generations and this has an effect on the attitude of users, on the quality characteristics of operations and often on the modernization of the technological process itself.

8984
CSO: 2502/68

MIKROMODUL JOINT ENTERPRISE

Budapest SZAMITASTECHNIKA in Hungarian Jul 85 p 3

[Article:"PressConferenceConcerningMikromodulJoint Enterprise"]

[Text] The leadership of the joint enterprise and the government commissioner for microelectronics held a press conference. Government Commissioner Mihaly Sandory said the following about the formation and tasks of the enterprise:

"In 1983 Elektromodul and the Microelectronics Enterprise (MEV) signed a contract for the export of domestically made microelectronic parts through Elektromodul. This could be accepted only as a first step because it did not create a closed innovation chain and it suited neither the economic interests of the Microelectronics Enterprise nor the requirements of a quickly changing world, namely that as few as possible intermediaries should be wedged in between the producer and the user. With the agreement of Elektromodul a new proposal was born, that the two firms should form a joint foreign trade enterprise for the export and import of parts for those products which figure or which will figure in the manufacturing plans of the MEV. This is about one half or one third of all microelectronic parts. Thus the Mikromodul Microelectronics Foreign Trade Joint Enterprise was created in the summer of last year.

"With the agreement of the two founding enterprises, the profile of Mikromodul developed in such a way that Elektromodul retained parts export and the MEV repeatedly requested foreign trade rights for its own special area. It has already received such rights on a case by case basis and in all probability it will receive full rights in the near future. It is expected that beginning with the third quarter of 1985 the MEV will have independent foreign trade rights in its chief profile. But it is not best to set up for the cultivation of a few areas within the MEV. Elektromodul must continue to trade in some of the parts. By their nature the requirements and rights deriving from the TEK [Capital Equipment Marketing Enterprise] function belong to Elektromodul. The MEV intends to conduct export-import activity only in areas where direct barter trade among socialist countries is clumsy or does not function.

"One of the primary areas of the enterprise will be taking care of technological equipment and know-how, so all these experts have gone to Mikromodul. Developing the necessary conditions and market contacts is also

their task. The next area is software. To a large degree the Hungarian parts program is concentrated on a product group requiring much scholarly work. It is possible to sell not only the product embodying the scholarly work but also the scholarly work itself--i.e. design methods. This requires a commercial house like Mikromodul. (Mikromodul has already done about 1.5 million dollars worth of export in the area of software, to capitalist countries in Western Europe too.)

"In a third area they want to make use of the capacity for designing equipment oriented circuits by selling the results of the work, the product, and not the capacity or the manpower. But this work requires a great amount of assets and the capitalist portion of these is very large. It is also important to have a sufficient number of experts available. (In an interesting way this third function will not have an effect on the domestic market at first.)

"In the future Mikromodul intends to manage these three areas of tasks. At present the software area is the strongest, but in the future trade connected with circuit design must represent a larger part. There is already a bid for a microelectronics plant to be realized within a prime contracting framework in which Mikromodul undertakes to install and put into operation know-how and machines existing in Hungary or to be purchased elsewhere and to teach the labor force to use the machines and conduct trade of this type. The developing countries represent the market first, but there is also the possibility of building up economic contacts with China."

Director Peter Lorant added:

"Among domestic enterprises we have begun a series of technical consultations with Videoton, the BRG [Budapest Radio Technology Factory] and the BEAG [Budapest Electroacoustics Factory] for the technological modernization of devices manufactured in relatively large series. Among the research institutes we have begun with the KFKI [Central Physics Research Institute] development of a circuit to be built into a simulator for nuclear reactors and work is being done on design of computer interface circuits too.

"With the socialist partners, discussions are taking place to undertake designing tasks for Tesla.

"Circuit development tasks are undertaken for capitalist customers too. The partners include firms from Austria, France, the FRG, Holland, Japan, Switzerland, Liechtenstein, Great Britain and Belgium. Naturally a significant number of the foreign customers are tied to a foreign technological base. The programs used in engineering design themselves represent great scientific and material value. The computer technology experts of the enterprise are dealing with the development of such programs; their sale can be accounted for as a signicant achievement already."

Management Data

"Despite the fact that the short time interval has been filled primarily with organization and preparing for the 1985 tasks, Mikromodul has managed to close

the year with a profit. The enterprise has put about 900,000 forints into its funds after taxes.

"The plan for 1985 prescribed trade of somewhat more than 1.4 billion forints. Of this, 85 percent is import and 15 percent is export. Realization of gross profit margin receipts of about 54 million forints is expected, which will cover a profit of 18 million forints after subtracting the enterprise costs.

"If the above plan is realized, Mikromodul may generate a profit interest fund of about 2 million forints out of the enterprise profit."

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UNSPECTACULAR COMPUTER DISPLAY AT FAIR

Budapest SZAMITASTECHNIKA in Hungarian Jul 85 p 5

[Article: "ESZR-MSZR, An Unchanged Offering"]

[Text] The diminished computer technology exhibits of the socialist countries at the Budapest International Fair this spring were characterized by product displays parading ESZR [Uniform Computer Technology System] system elements more colorless than earlier.

This is sad also because within the framework of the ESZR FT column we have regularly reported on the newest achievements of developments taking place in the socialist countries, achievements which well demonstrate the specialized development of uniform computers and equipment, compatible with one another, and the efficiency of their manufacture.

Without seeking the reasons for the absences from the exhibit, we would like to say a few words below about what was displayed.

Complex computers and systems characterized the present offering of the Soviet Union--which has already exported more than 160 computers to Hungary. The offering consists of large capacity, universal computers--the ESZ 1061, the ESZ 1045.01 (see the description in the October 1984 issue of SZAMITASTECHNIKA), the ESZ 1036 and the ESZ 1066 (see the description in the February 1985 issue of SZAMITASTECHNIKA). Operating in these systems are the 200 M byte capacity magnetic disk subsystem, the ESZ 5580 (control unit), the ESZ 5680 (control module), the ESZ 5080 (exchangeable magnetic disk store) and the ESZ 5280 (exchangeable disk pack), which was demonstrated at the Budapest International Fair in the offline mode. Their MSZR [minicomputer system] 1300 system was a nice example of the cooperation taking place in CEMA since it uses Videoton displays and Robotron printer as OEM units.

Bulgaria organized its display concentrating on the export of data preparation equipment.

The Bulgarians would like to break into the Hungarian market with products--the ESZ 9114 floppy disk data preparation equipment and the ESZ 9005 magnetic tape multiple console data preparation system (they have been manufacturing both since 1982)--to satisfy domestic needs which perform the same tasks as

equipment already available to domestic users--the TAP-34 manufactured by the Telephone Factory and the Polish MERA 9150 system, sold for several years by the SZAMALK [Computer Technology Applications Enterprise].

We could also learn at the Bulgarian stand about a hard disk Winchester store, which is of considerably greater interest to the market. The ESZ 5300 is 5 1/4 inches in diameter and has a capacity of 6.38 M bytes. Izotimpex exhibited it for the first time at the beginning of the summer in Peking. Series manufacture of the hard disk store and of a 16 bit professional personal computer will begin in the second half of 1985 and they are planning their export beginning in 1986.

Czechoslovakia has specialized in the socialist camp for the development and manufacture of graphic information input and output equipment. At the fair they exhibited an ESZ 7901 M1 (DGF-1208a) graphic device operating in conjunction with an SZM 52/11 computer. This cannot be regarded as truly new since the product being exhibited is a further developed version of the ESZ 7901 developed in 1979.

Poland exhibited its magnetic tape data preparation system (ESZ 9150), proven in earlier years and popular among domestic users, and D-100 (ESZ 7189) and D-200 matrix printers. In the case of the printers large series manufacture has been accompanied by a significant price reduction. Two years ago the D-100 printer had a price of 4,800 rubles, today it can be obtained at a price around 1,800 rubles.

The new thing for the Videoton ESZ 1011 small computer was the store, expandable to 4 M bytes, and the Vidicop disk control processor.

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PANNONGRAPHICS, NEW JOINT ENTERPRISE

Budapest SZAMITASTECHNIKA in Hungarian Jul 85 p 7

[Article: "Pannongraphics Formed"]

[Text] A joint enterprise founded by the MTA SZTAKI [Computer Technology and Automation Research Institute of the Hungarian Academy of Sciences] and the HTSZ [Communications Engineering Cooperative] for technical development purposes came into being practically at the time of this spring's Budapest International Fair. The chief area for Pannongraphics is computer graphics, and the higher category equipment therein. The task of the MTA SZTAKI is to realize hardware and software developments while that of the HTSZ is large volume manufacture, handing the products over to Pannongraphics. At the fair both enterprises exhibited the products which will be traded through Pannongraphics in the near future. These are the Tekemu graphics display, the Texpro text editing terminal, the GD80 graphics system and the color GKS terminal. On the one hand Pannongraphics will provide marketing activity but on the other hand it will also perform system integration tasks, thus undertaking to deliver complete systems. The goal in creating the joint enterprise was to harmonize manufacture and development and provide motivation on the basis of the market. From the viewpoint of the customer or user the creation of Pannongraphics may bring a qualitative change, and it offers advantages to both founding firms as well. The SZTAKI will be freed of the task of providing technology for developmental models and the HTSZ will be better able to organize the relatively large scale manufacture while Pannongraphics will be very helpful in servicing ad hoc user needs.

The activity of Pannongraphics this year is expected to include manufacture and sale of 15 GD80 systems (five terminals and ten autonomous graphic systems). The greatest interest in these is in the GDR. Organizing and starting the manufacture of the Tekemu graphics display will take place this year and according to the plans 50-100 of them will be made in 1986. The transfer-receipt of the prototype of the Texpro terminal is taking place now and 10-20 of them will be sold in 1986, primarily for press, office and editorial applications. The color GKS terminal will appear in 1986.

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HUNGARY

PROFESSIONAL PERSONAL COMPUTERS

Budapest SZAMITASTECHNIKA in Hungarian Jul 85 p 12

[Article by Sandor Hauzman: "Professional Personal Computers in the MSZR"]

[Text] Member countries participating in the development of the MSZR [small computer system] Series 3 are concentrating on the professional personal computers, representing a serious customer market. Development of these machines is taking place in practically all the countries and probably Hungarian users will favor, in addition to the offering of domestic manufacturers, those foreign shippers who offer the customer suitable microperipherals (matrix printer, Winchester disk store, etc.) and a rich software assortment with the central unit.

We will describe below the IZOT 1030C professional personal computer developed by the Bulgarian People's Republic the MSZR qualifying tests of which will be performed at the end of this year.

The chief applications areas for the machine are:

--building up local subsystems for data processing,
--creating work stations in integrated administrative systems,
--building up design automation systems.

The computer, which uses a K1810 VM86 16 bit microprocessor of Soviet manufacture, has a number of substantial advantages in comparison to the existing 8 bit systems (for example, the Bulgarian SzM-50/40-3 machine):

--a significant increase (about threefold) in processor performance,

--a significant increase (about threefold) in operating memory capacity,

--an increase (about double) in reliability,

--a significant increase in background memory capacity (more than 10-fold with the Winchester type disk stores) while preserving the external dimensions,

--realtime mode,
--multiuser mode with a UNIX compatible operating system.

The following peripherals figure in the computer system:

--a monitor, 25 lines by 80 characters,
--ESZ 7187 daisywheel printer or IZOT 6305 matrix printer,
--two ESZ 5082/ESZ 5083 or ESZ 5321/ESZ 5323 floppy disk stores,
--a Winchester type magnetic disk store (in a later phase).

The module capacity of the single card system operating memory is 64 K bytes or 256 K bytes (depending on the IC type used).

The minimal capacity of the local operating memory and the operating memory of the system is 192 K bytes.

The maximal capacity of the local operating memory and the operating memory of the system is 1 M bytes.

The basic software is:

--a CP/M-86 compatible operating system,
--an ISIS-II V.4.3 compatible operating system,
--an RMX/86 + MMX/800 compatible operating system,
--a UNIX compatible operating system.

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EXPORT OF SOFTWARE DEVELOPING SYSTEM

Budapest SZAMITASTECHNIKA in Hungarian Jul 85 p 15

[Article by "tg": "A Software Development System for Export"]

[Text] Hungarian software now has a good reputation abroad, thanks primarily to a few software products of outstanding quality such as the Prolog systems of the SZKI [Computer Technology Coordination Institute], the game software of Novotrade and the design programs of the Graphisoft GMK [economic work association].

The SZAMALK [Computer Technology Applications Enterprise] and the SZKI expect similar successes on the international market for the Softorg system which was introduced recently to West German, Austrian and Hungarian professional journalists in a lecture series of several days.

Softorg is a software product supporting various phases of program development--from specifications to maintenance--and consisting of seven modules--which can be used separately too. It was developed in a three-way cooperation of the West German Software Engineering Gmbh (SES), the SZAMALK and the SZKI. The SES provided the specifications and regular Budapest consultation while the Hungarian enterprises provided the intellectual and computer capacity.

Thus far four modules of the system have been finished. The SZAMALK completed the Softdoc (aiding documentation) and the Softest (aiding testing of source modules) subsystems while the SZKI completed the Softspec (supporting the description of specifications) and the Softcon (which can be used in the system and program design phases) modules. The parts still under development are: Softman (guiding, checking and scheduling the program development work) at the SZKI and Softint (system integration) and Softgen (system generation) at the SZAMALK.

The Softcon and Softspec modules are conversational. Thus far there are about 50 man years of work in the system, development of which began in 1980.

The Softorg system will probably be complete by the middle of 1986; the modules have been written in the COBOL and PL/I languages and can be run on ESZR [uniform computer technology system], IBM or IBM compatible machines.

Simultaneous use of all modules requires 4 M bytes of central memory and about 800 M bytes of disk background storage. Naturally a configuration with a capacity smaller than this is sufficient for separate use of individual modules.

Because of the resource demand mentioned the product is much better known on the West German market than here at home for the time being. More than 20 enterprises in the FRG--including the BMW AG, the Bertelsmann AG, the Deutsche Bank and the NIXDORF AG--have been using one or more modules of those finished for longer or shorter periods of time.

Domestic users can be sought primarily among those who have ESZ 1045 or ESZ 1055 computers. The greatest interest is being shown in the Softdoc documentation module, among other things because it significantly facilitates the transfer of programs from an old computer to a new one when switching to a new computer.

The first installation was in April, at the Debrecen center of the Trans-Tisza Power Supply Enterprise, on an ESZR machine.

In addition the developmental enterprises are using the already finished parts of the Softorg system for the modules still being prepared.

The Softorg software product is the property of the SZKI and the SZAMALK, marketing in German language areas is done by the SES, in socialist countries by one of the Hungarian enterprises, and elsewhere by any cooperation partner.

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POLAND

NEW, REFINED METALLURGICAL PRODUCT PATENTS FOR 1984 LISTED

Katowice HUTNIK in Polish Nos 1, 4, 6, Jan, Apr, Jun 85

[Article by Engineer Michal Musial:"Inventions and Improvements in Steelmaking; Inventions and Patents According to the Patent Office Newsletter"]

[No 1, Jan 85 pp 35-36]

[Text] For many years HUTNIK has been informing its reader about the titles of the latest inventions (patents), product-process improvements, and pre-production models which could be of interest to them. Below we give the definitions of these concepts.

An invention, according to the descriptions given in encyclopedias (The Universal Encyclopedia PWN Polish National Publishing House, Warsaw Vol 9 p 647, Vol 12 pp 196 and 560; Polytechnical Vocabulary, The Soviet Encyclopedia, Moscow, pp 16, 177, 348, 416) is a new solution to a problem, which distinguishes itself with outstanding and separate virtues in any area of the national economy, in the building of culture-society, or in national defense; giving a positive effect (or becomes applicable after the appropriate conditions are established.) An invention may be protected with a creator's certificate or a patent for the author or institution (for example this may be scientific body or an industrial enterprise.)

A product or process improvement is a new technical solution used to improve present technology, the techniques of production, methods of technical control, product quality, and safety conditions, protection of the workers' health and the natural environment, increase in production yield and utilization, better use of production potential, energy, raw materials etc. Differentiating the product-process improvement from an invention is the fact that product-process improvement does not have to have the quality of newness in the scope of a given branch of production; its object is to apply a certain solution in a given enterprise which may be an adaptation of a solution already used in another enterprise. The newness of the product process improvement is of a local nature, that is, it has a significance for a given enterprise or group of enterprises.

A pre-production model is a technical execution of an object, to date not used in Poland, as an assembly, construction of a permanent nature which enables better utility or ease in the use of this object.

Technical progress is characterized by changes from old to new technology, then to newer or most modern. The implementation of product-process improvements, inventions, and preproduction models into the steel industry helps to obtain additional value from the same areas or from the capabilities of production equipment.

Nos 1-3, 1984

Feed Mechanism for Centerless Grinders, Kazibudzki Z., Pilszak A., Dreszer G., Wasik P., "Jednosc" Steelworks, Siemianowice Slaskie. 128218

Articulated sill end connector, Mowak H., Powezka T., Korus M., Wachalewski W., Lennin Steelworks, Krakow. 128360

A mortar for joining elements in sliding enclosures for steel pouring, Gruca J., Olbrychtowicz J., Pawelek A., Witkowska-Wolnik E., Gliwice Refractory Manufacturing Enterprise, Gliwice. 128348

A method for cooling coke oven gas and an apparatus for using this process, Whek K., Wysocki M., Bunar S., Mamon K., Bazela Cz., "Koksoprojekt" Bureau for Coke Industry Projects, Zabrze, 128175

A method for manufacturing bands and sheets with one side covered by a protective coating, Gasior E., Gola W., Gorecki W., Mniszek K., Prajsnar T., Schwedler A., Klopkowski R., Iskra R., Strama S., Richta E., Matyjek A., Iron Metallurgy Institute, Gliwice, 128302

An air-gas burner with quantity-quality regulation, Mrowiec J., Welding Institute, Gliwice, 128470

Multiroller conveyor scale, Bander J., Gabrys S., Piaskiewicz T., Dziuba T., "Hutmaszprojekt" Bureau for Steelmaking Studies and Projects, Katowice, 128300

Digital to analog converter, Procel K., Iron Metallurgy Institute, Gliwice, 128446

Lubricant for cold forming of plastic, especially for stamping from thick steel sheet, Kajdas Cz., Lojek K., Bugaj A., Swietokrzyska Polytech, Kielce, 115227

Filter insert, Rotko M., Grabowski S., M. Buczek Steelworks, Sosnowiec 37177

Straightener for steel rods, Wasowski Cz., Piskon J., "Hutmaszprojekt-Hapeko" Bureau for Projects, Supply and Completion of Steel Mill Machinery, Katowice 37246

Mechanism for guiding bars while turning, Kraszewski J., Ksiazek K., 37255

Drum type rail car dumper with a cradle configuration, Zylka G., Research and Development Center for Cranes and Transport Devices, Bytom. 128745

A method for producing refractory materials for lining steel-pouring ladles, Stachurski J., Bocian J., Bednarczyk S., Przegedza O., Kopczynski Z., Owczarski Z., Kolomyjski B., Ryba R., Zarow Refractory Materials Enterprise, Zarow. 128700

Tool steel alloy intended for hot working and heat-chemical treatment, Panasiuk W., Wyszkowski J., Szyszka Z., Szatkowski W., Institute for Precision Machinery, Warsaw 128730

A method for producing refractory grog with a high content of aluminium oxide, Mularczyk M., Drozdz M., Szymborski W., Pawlowski S., Jackiewicz B., Stras W., Kawala T., Refractory Institute, Gliwice 128789

A throttling cut-off valve, Karas A., Ziemba T., Stalowa Wola Steelworks, Stalowa Wola. 128671

Gas-oil burner, especially for open hearth furnaces, Butrym S., Karpala A., Bocho J., Szczypko E., Jedraski J., Samela M., Lenin Steelworks, Krakow, 12821

A system for measuring the actual resistance of materials made from carbon and graphite, Czastkiewicz Z., Polechonski W., Tochowicz S., Slask Polytech, Gliwice, 128715

A method for compensating wattless power in asymetrical three phase receivers, Bisztyga K., Pirog S., Senkowski J., Hanzelka Z., Kwasnowski P., Steelworking-Mining Academy, Krakow. 128760

Square charge piercer, Siudmak L., Kowalski J., Starzykowski Sl., Solarski T., Maran Buczek Steelworks, Sosnowiec, 37299

Measuring set for welding work control, Malciak J., Krukowiecki A., Katowice Steelworks, Dabrowa Gornicza, 37348

An electrode for surfacing Hadfield steel by welding, Pilch J., Sitko J., Lorkiewicz M., Lubojanski J., "Baildon" Steelworks, Katowice, 129027

A mechanism for lifting and tilting the cross beam on travelling cranes, especially those used in steelworking, Majka Kazimierz, "Hutmaszprojekt" Bureau for Studies and Equipment Projects for Steelworking, Katowice, 128993

A method for manufacturing roasted dolomite, Stucharski J., Bolek B., Stachanczyk A., Platek S., "Szczakowa" Dolomite Enterprise, Jaworzno, 128992

Lubricant for drawing, Prajsnar T., Smolarczyk Z., Cieplinski J., Liszka G., Lebioda R., Bakalarz S., Kocwin E., Grzybowski W., Iron Metallurgy Institute, Gliwice, 128993

Water cooled blast furnace tuyere, Pasierb Sl., Lukaszewski J., Gaweda E., Kreczko A., Wolwender A., Marusinski J., Bartnik J., Niemczyk E., Jaworski J., Janita R., Katowice Steelworks, Dabrowa Gornicza, 128951

A method and an instrument for indicating the plastic limits for tool and high speed steels, Chojnowski K., Research and Development Center for Image Converters, Warsaw 129103

Pusher head for sleeve forming dies, especially for forming seamless pipe, Tarasek J., Higher Pedagogic School, Opole 37409

Shot blast machine for two sided cleaning of sheet metal, Hebasinski K., Opyrchal J., Kopanski W., Brzezinski L., "Hutmaszprojekt-Hapeko" Bureau for Projects, Supply, and Completion of Steel Mill Machinery, Katowice, 37453

Travelling crane buffer beam, Korus M., Nowak H., Lenin Steelworks, Krakow, 37426

An instrument for ultrasonic measurement of sleeve wall thickness, Pawlowski Z., Martofel R., Sordyl T., Cebo K., PAN [Polish Science Academy] Institute for Fundamental Technical Problems, Warsaw, 37452

An instrument for testing the durability of electro-coated steel sheet surfaces, Aleksandrowicz R., Lenin Steelworks, Krakow 37431

[No 4, Apr 85 pp 156-158]

[Text] No 4, 1984

The construction of the bag filter ceiling with the assembly for hanging the bag filters, Szulc S., Maron H., Glonek J., John A., "Bipromet" Bureau for Non-Ferrous metal Projects, Katowice, 129176

A mechanism for steering lift anvils, Koncewicz S., Rabus J., Hebdzyski R., Jedrzejowski S., Heydel Z., Zalitacz J., Slask Polytech, Gliwice 129232

Basic coated electrode for steel welding, Kraszewski S., Ziemianski J., Sitko J., Welding Institute, Gliwice, 129232

A feeder for transverse rods, of varying diameter, at random, especially for a multipoint spot welder, Libera K., Olczyk Z., "Techma-Aspa" Paris Commune Plant for Manufacturing Welding Equipment, Wroclaw 129271

An apparatus for division and centering, Opyrchal J., Habasinski K., Lach J., Gallert G., Krenczyk J., "Hutmaszprojekt" Bureau for Steelworking studies and Projects, Katowice, 129130

A method for manufacturing silicon carbide and an apparatus for manufacturing silicon carbide, Wozniak K., Sobczak J., Kuligowski Z., Pipczynski L., Soltysiak W., "VIS" Tool Enterprise, Warsaw, 129260

A method for recovering wolfram from sludge from the manufacture of prewolfram amonia from wolfram bearing raw materials, Bryjak E., Kozlowski W., Bukowiecki J., Kwasny Z., Krajzel., Zak J., Majorowsaki Z., Poluch K., Koscielniak Z., Zacharzewski B., Baildon Steelworks, Katowice, 129309

A method for oxygen-nitrogen treatment of steel products, especially tools made of high speed steel, Panasiuk J., Institute for Precision Machinery, Warsaw, 129264

An assembly for steering the cross-piece in a forging hydraulic press,. Pizon A., Stachowicz M., Szczesniak Z., Morawski W>, Swietokrzyska Polytech, Kielce, 129228

A valve for regulating large drops in pressure, Adamowicz K., Buben A., Rybnicki A., Senderski Z., Institute of Heat Technology, Lodz, 129250

Arched ceiling for a steelmaking furnace, Gudra P., Krawczyk A., Sasiadek S., Smietanko Z., "Kosciuszko" Steelworks, Chorzow, 129233

An apparatus for blow-feeding powdered materials, Sabela W., Matysik Cz., Kuc K., Wozniacki W., Peszko W., Iron Metallurgy Institute, Gliwice, 122874

A bidirectional hook trolley, Jonca J., Ludyga J., Kuc K.., Marek T., Ogrodnik R., Sitek J., Iron Metallurgy Institute, Gliwice, 119226

Abrasion resistant weldable steel, Bialecki M., Kania W., Gulinski R., Machniewicz J., Pilinski A., Stan T., Kaszuba W., Franusiak K., Bidzinski Z., Mendera J., Iron Metallurgy Institute, Gliwice, 119839

Furnace wall, suited for soaking pits, Madejski L., Notonski J., Szawica F., Radom Refractory Materials Enterprise, Radom, 127175

Silencer for dust laden gas, Dyszlewska K., Podsekowski A., Polok J., "Barowent" Enterprise for Research and Development of Air Conditioning, Ventilating and Dust Removing Apparatus, Katowice, 126225

A multi-cutter milling head for machining keyways into roll tenon ends for rolls made of hard materials, Pyz K., Szalanski L., Metallurgical Group, Lenin steelworks, Krakow, 37522 [pre-production model]

Cross beam, Podstawowy M., Ignasiak F., "Biprohut" Bureau for Steel Industry Projects, Gliwice, 37548 [pre-production model]

Blast furnace, Jablonski J., Czestochowa Polytech, Czestochowa, 37616 [pre-production model]

Charging box for a steelmaking furnace, Pyplacz J., Pyplacz J., Dabrowa Gornicza, 37574 [pre-production model]

No 5, 1984

Segmented journal busing for a roll mill, especially for a cogging mill, Warwas L., Bral S., Drewniok E., Klimas P., Kosciuszko Steelworks, Chorzow, 129462

An apparatus for mechanical removal of scale from rolled product, Janczyn L., "Biprowumet" Bureau for Projects in the Metal Products Industry, Krakow, 129340

A rotator for pipe being straightened on a horizontal press, Piskon J., Wasowski Cz., "Hutmaszprojekt" Bureau for Studies and Projects of Steelworking Equipment, Katowice, 129460

A method and an apparatus for coke quenching, Kaczmarek K., Naczynski J., Kowalik W., Wendeker M., Gas and Oil Mining Institute, Krakow, 129380
Lubricant for drawing, Prajsnar T., Smolarczyk Z., Cieplinski J., Iron Metallurgy Institute, Gliwice, 129434

A modifier for chrome steel alloy which is resistant to strike and abrasion, intended for the working parts of a ball mill, Gavronski J., Sakawa W., Jura S., Labedzki M., Krajczy B., Zabib-Kowalewska M., Dybel J., Slask Polytech, Gliwice, 129420

A method for heat chemical treatment of a metal surface intended for the surfaces of working elements in tools and machines, Szelc J., Stolarski B., Rog S., Janczur Cz., The Chief Technical Organization, Krakow Branch, Technical Services Group, Krakow, 129633

An apparatus for lubricating with an oil mist, intended for use with toothed gear transmissions, Panz M., Karge Z., Stanoszek J., "Biprohut" Bureau for Steel Industry Projects, Gilwice 129501

Electrical setup for lighting and detecting the flame of a burner, intended for a steelmaking furnace burner, Staruszkiewicz R., Stanoszek J., "Hutmaszprojekt" Bureau for Studies and Projects in the Steel Industry, Katowice, 129567

Layout for cooling water supply piping for the tuyeres of a blast furnace, Czerski J., "Biprostal" Bureau for Studies and Projects in the Steel Industry, Krakow, 129472

The layout for an analog speed controller for steering and sequential correction of the speed in continuous rolling mills, Grzybowski W., Krajewski J., Zylka-Zebracki M., "Hutmaszprojekt" Bureau for Studies and Projects in the Steel Industry, Katowice, 129485

An electronic safeguard for the return side of high tension transformers coupled to a switching control, Niebylski A., Szymczukiewicz I., Zydron S., "Hutmaszprojekt-Hapeko" Bureau for Projects, supply, and Completion of Steel Mill Machinery, Katowice, 129621

A method and setup for compensating wattless power, Swinski J., Sroka S., "Hutmaszprojekt-Hapeko" Bureau for Projects, Supply, and Completion of Steel Mill Machinery, Katowice, 129566

Rolling mill head for the manufacture of finned pipe, Bazan J., Nowak S., Pasierb A., Richert J., Swiatkowski K., Urbaniak Z., Gocal J., Wielgos F., Pilat B., Pasierb S., Mining and steelworking Academy, Krakow, 124742

Soft solder with a lead matrix, Joszt K., Turon J., Winowski A., Brys S., Kuzio T., Rybak W., Buczma M., Orczyk A., Non-Ferrous Metals Institute, Gliwice, 128866

A high pressure, twin reactor acetylene gas generator, Blahut S., Bielawicz L., "Cespa" Cieszyn Welding Machine Manufacturing Enterprise, Cieszyn, 37710 [pre-production model]

Ribbed nozzle backing plate, Kansy J., Bregula P., Trzensisko P., Ballon W., Karol Swierczewski Steelworks, Zawadskie, 37626 [pre-production model]

A gauge for checking the perpendicularity of a hole's axis in relation to the top surface, intended for connecting rods, Kakrecki J., "PZL [Polish Aircraft Industry] -Wola" M. Nowotko Machine Shops, Warsaw, 37628 [pre-production model]

No 6, 1984

An apparatus for catalytic gas purification, especially industrial vent gasses, Wojciechowski J., Gozdziewicz Z., Busko J., Forys J., Rachwal A., Polish Academy of Science, Catalyst and Physical Chemistry of Surfaces Institute, Krakow 129862

An apparatus for removing solidified steel fragments from pouring ladles, Gruszynski L., Millak T., Beldzik B., "Hutmaszprojekt" Bureau for Studies and Projects for the Steel Industry, Katowice, 129796

Flexible self-aligning crankshaft, Daniecki R., Chromniak A., Mastek J., Lenin Steelworks, Krakow 129909

A method for preparing unpickled rolled steel for drawing, Prajsnar T., Iron Metallurgy Institute, Gliwice, 129688

Steering assembly for a forging manipulator, Karlinski W., Szczesniak Z., Mierzwa Z., Pizon A., Stachowicz M., Swietokrzyska Polytech, Kielce 129918

An apparatus for hardening and grinding circular saw blades, Drzensla N., Kedziora J., Klyta A., Kosciuszko Steelworks, Chorzow 129875

Layout for powering the transport of shapes while they are being welded, Bula J., Hatko R., Kobos J., Siedzina M., Ksiazkiewicz D., Biszczuk Z., Stach J., Zoremba P., Oles H., Krenczyk J., "Hutmaszprojekt-Hapeko" Bureau for Projects, Supply, and Completion of Steel Mill Machinery, Katowice, 129699

Hook pulley block, Piernikarczyk J., Krzysztolik H., "Biprohut" Bureau for Projects in the Steel Industry, Gliwice, 129712

Drwaing Lubricant, Prasjnar T., Smolarczyk Z., Iron Metallurgy Institute, Gliwice, 129699

A method for hot working austenitic steel corrosion resistant wire, especially in preparation for wire weaving, Babinski W., Griner S., Krukiewicz W., Domagala R., Leskiewicz J., Weniger Z., Slask Polytech, Gliwice 129743

Measuring layout for a totalling electromechanical scale with digital indicator, Procel K., Iron Metallurgical Institute, Gilwice, 129697

Induction crucible furnace, Chmielewski K., Magiera K., Wojcik M., "Hutmaszprojekt" Bureau for Studies and Projects in the Steel Industry, Katowice, 129920

A filter for the initial cleaning of a gas, especially air; Tabis A., Metallurgical Group Katowice Steelworks, Dabrowa Gornicza, 37773 [pre-production model]

A device for removing the form pattern from a ladle after the ladle had been lined with refractory material, Piernikarczyk J., Chomick L., "Biprohut" Bureau for Projects in the Steel Industry, Gilwice, 37752 [pre-production model]

Anchor nail, Prajsnar T., Malczewski J., Pietrzyk M., Zglobicki E., Pasinski A., Iron Metallurgy Institute, Gliwice, 37800 [pre-production model]

Charging door for industrial furnaces, Stwora E., "Hutmaszprojekt" Bureau for Projects, Supply, and Completion of Steel Mill Machinery, Katowice, 37797 [pre-production model]

[No 6, Jun 85 pp 216-217]

[Text] No 7, 1984

Bulk material cover for heat retention for pouring killed steel ingots, Szlenk I., Magiera J., Ciemciok C., Brach J., Klakus P., Mrorzek A., Mazur J., Pouring Machine Supply Enterprise, Tychy 130322

A method for degassing coal, Henryk Zielinski, Institute for Chemical Coal Processing, Zabrze, 130399

A method for rolling rails, Gawlikowicz J., Schwedler A., Ludyga J., Bogusz R., Maciosowski A., Cesarz S., Struk S., Mucha M., Koszuta L., Ptaszny E., Bartodziej R., Iron Metallurgy Institute, Gliwice, 130236

A steel alloy resistant to strike and abrasion, intended for the working parts of a ball mill, Sakawa W., Jura S., Labedski M., Gawronski J., Sokolowski J., Krajczy B., Zabik Kowalewska M., Kus B., Dybel J., Soltysek A., Golob A., Szemiel B., Slask Polytech, Gliwice, 130236

Steel alloy resistant to abrasion, Sakawa W., Jura S., Chruszcz T., Golanka L., Katolik Z., Krzywda Z., Kus S., Skowronek F., Brozek Cz., Slask Polytech, Gliwice, 130172

A pressure sensor for indicating the presence of material between mill rolls, Zyla F., Michalik A., Iron Metallurgy Institute, Gliwice, 130094

A method for thermal working of intermediate electrode products in multi-chambered circular furnace, Lebiedziejewski M., Kolowca J., Jungiewicz J., Kosakowski Z., Kulig W., Coal-Electric Enterprise in Sacz, Nowy Sacz, 130360

A method for preparing unpickled roll steel for drawing, Prajsnar T., Iron Metallurgy Institute, Gliwice, 129688

Drawing lubricant, Prajsnar T., Smolarczyk Z., Iron Metallurgical Institute, Gilwice, 129699

A form for lining a pouring ladle with refractory material by the method of throwing on the refractory material, Kolomyjski B., Grabowski E., Bonenberg Z., Klos R., Reka F., Jurga W., "Biprohut" Bureau for Projects in the Steel Industry, Gliwice, 37845 [pre-production model]

A device for measuring the diameter of thread core, especially the thread of knuckle bolts, Karas W., Baildon Steelworks, Katowice, 37884 [pre-production model]

No 8, 1984

Sintering machine with conveyor for processing iron ore, Hamerlak S., Dziuba T., Krol L., Skoczylas L., Gruszczynski H., "Biprohut" Bureau for Projects in the steel Industry, Gliwice, 130549

A method for rolling pipe on a push-through mill, Tarasek J., Trzaska A., Higher Pedagogical school, Opole, 130639

Layout for the regulation of reverse power with a sequentially driven inverter, Manitus J., Zygmunt H., Wyzga J., Zur A., Senderski A., Macko P., Endler M., Grzybowski W., Kuczek J., Steelmaking-Mining Academy, Krakow, 139689

A method of manufacturing sleeves for making multiwalled pipe, Kubinski W., Starowicz J., Wcizlo Z., Steelmaking-Mining Academy, Krakow, 130672

Setup for cleaning the surface of rolled stock destined for wire drawing, Prajsnar T., Wustatowski R., Iron Metallurgy Institute, Gliwice, 130540

Layout for remote control of a transformer welding machine, Lozicki H., Bialy K., Ulfik A., "Labeda" Steelworks, Gliwice, 130391

An apparatus for transporting bar and pipe, Langer M., Udziela W., Wolski L., "Biprohut" Bureau for Projects in the Steel Industry, Warsaw Branch, Warsaw, 130462

A device for the disconnection of the main crane contactor in an emergency, Bak Z., Gadzala B., Lenin Steelworks, Metallurgical group, Krakow, 130411

A method of regulating the slag grannulation process, Pasierb S., Kreczko A., Zydsiak E., Gadzala B., Katowice Steelworks, Metallurgical group, Dabrowa Gornicza, 130411

A method of indicating corrosion resistance and the effects of reductive and non-reductive treatment on the corrosion of the surface of steel, Marzec S., Gierzynska Dolna M., Galka S., Slask University, Katowice, 130644

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